Forest Health Protection
Pacific Southwest Region

Date: January 21, 2010
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To: District Ranger, Hat Creek Ranger District, Lassen National Forest

Subject: Evaluation of fire-injured black oak within the 2009 Browns Fire (FHP Report NE10-04)

At the request of Jim Simmons, Assistant Culturist, Hat Creek Ranger District, I visited the Browns Fire on December 10, 2009 to evaluate the condition of fire-injured black oak (*Quercus kelloggii*) within proposed salvage harvest units. The objectives of this visit were to assess the extent of tree injuries and help design site specific marking guidelines for tree removal. Jim Simmons and Ben DeBlois, Project Forester, accompanied me in the field.

Background

The Browns Fire (part of the Hat Creek Complex) burned 1,865 acres between August 1 and August 10, 2009 along Highway 89 near the community of Hat Creek, CA (T34N, R4E, Sections 4, 5, 8 and 9). The elevation of the site ranges between 3,500 and 4,200 feet and receives an average of 25 - 30" of annual precipitation. Forest composition consists of ponderosa pine (*Pinus ponderosa*), incense cedar (*Libocedrus decurrens*), Douglas-fir (*Pseudotsuga menziesii*), white fir (*Abies concolor*) and black oak (*Quercus kelloggii*). The management objectives for this fire-salvage project are to remove fire-killed and severely fire-injured trees to reduce fuels, facilitate reforestation (including black oak), and to abate roadside danger trees.

Observations

Fire-injuries sustained by trees within the Brown's Fire are typical for most mixed severity fires, ranging from light heat scorching of crowns and light basal charring to complete consumption of foliage and severe cambial kill. Fire caused crown and bole injuries within the Brown's Fire vary by site, species and tree diameter. However, there are several high severity fire areas where the mortality of all tree species was near 100 percent. These high severity areas are where the

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majority of post-fire salvage and reforestation activities will occur.

The following observations of fire-injured black oak were made within high and moderate fire-severity areas:

- Small diameter black oak trees (<12" dbh) sustained high levels of cambium kill as nearly all stems observed with bole charring were completely dead.
- Crowns of small diameter oaks had nearly all foliage and small branches heat-killed or consumed.
- Basal sprouting was observed on the most severely fire-injured oaks of all size classes.
- Larger diameter oaks (>12" dbh) sustained less severe injuries on average due to thicker bark and higher crown heights. However, most of the larger oak stems within high-severity areas still received lethal fire-injuries to basal cambium and upper branches and foliage.
- Oak stems that were heat killed but not consumed retained nearly all scorched foliage (no abscission layer formation) making them easy to identify.

Marking Guideline Recommendations

The following recommendations are based on the condition of black oak stems observed within the Browns Fire. However, these recommendations may be applied to black oaks found in other Hat Creek Complex fire areas.

Black oaks stems with the following characteristics should be considered dead (Note: root system may be alive and sprouting may be evident at root collar):

1) All black oak stems with foliage consumed and trunk, branches, and twigs completely charred.
2) All small diameter (<12" dbh) stems with basal charring over ¾ of bole circumference and/or complete retention of heat killed foliage.
3) All large diameter (>12' dbh) stems with cambium kill over ¾ of bole circumference (sample within charred quadrants to verify cambium condition) and/or complete retention of heat killed foliage.

If you have any questions regarding this report, need additional information, or would like to request field training for marking crews, please contact me at 530-252-6431 or dcluck@fs.fed.us.

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